A NEW LOCALITY RECORD AND NOTES ON THE DISTRIBUTION OF *TRAPEZITES WATERHOUSEI* MAYO & ATKINS (LEPIDOPTERA: HESPERIIDAE)

ANDREW A.E. WILLIAMS[1] and MATTHEW R. WILLIAMS[2]

[1]*Department of Conservation and Land Management, W.A. Wildlife Research Centre, PO Box 51, Wanneroo, WA 6065*

[2]*Department of Conservation and Land Management, Science Division, 50 Hayman Road, Kensington, WA 6152*

Abstract

Trapezites waterhousei Mayo & Atkins is newly recorded from Lochada Pastoral Station, north-east of Perenjori, Western Australia. In captivity, larvae readily switched from *Xerolirion divaricata* A.S. George to an alternative food plant, *Acanthocarpus preissii* Lehm. (both Laxmanniaceae). The disjunct distribution of *T. waterhousei* and its *Xerolirion* food plant is discussed.

Introduction

The laterite ochre, *Trapezites waterhousei* Mayo & Atkins, is an endemic Australian skipper restricted to inland southwestern Western Australia, where it has previously been recorded from 11 disjunct localities between Paynes Find and Southern Cross. Colonies are centred around rocky outcrops where the sole known food plant, *Xerolirion divaricata*, occurs (Mayo and Atkins 1992, Williams *et al.* 1996). Adults have always been found in close proximity to this food plant; the life history was recorded by Williams and Atkins (1997).

Recent observations

In July 2003, we found *T. waterhousei* on Lochada Pastoral Station, 75 km north-east of Perenjori. This is approximately 85 km north and west, respectively, of two previously known sites at Breakaway Wells and Paynes Find (Williams *et al.* 1996). At Lochada, *X. divaricata* was growing commonly on a decaying granitic breakaway (28°56'S, 116°50'E) on the eastern boundary of the pastoral station. Searches on the food plants revealed old hatched pupal cases and a number of mid-stage larvae.

The larvae were collected and taken to Perth to be reared in captivity. Before they reached maturity, the supply of *Xerolirion* became mouldy and the larvae were transferred to *Acanthocarpus preissii*, a known food plant for other Western Australian species of *Trapezites* Hübner. The larvae built shelters and fed readily on this alternative food plant before pupating. Adults emerged in October.

Discussion

Acanthocarpus and *Xerolirion* are closely related taxa which formerly belonged to the Dasypogonaceae, a south-west endemic plant family (Hopper and Gioia 2004). Recent genetic work, however, indicates that the contemporary classification for these two genera is in the Laxmanniaceae

[which includes the Lomandraceae] (Stephen Hopper, pers. comm.). *Xerolirion* almost certainly was derived from '*Acanthocarpus*' ancestral stock (Greg Keighery, pers. comm.). *A. preissii* has a near-coastal distribution and is abundant along the west coast of Western Australia, from Dunsborough to North West Cape, with some outlying populations between Bunker Bay and Augusta and at Windy Harbour. By contrast, *X. divaricata* is found only inland, where it is restricted to decaying granitic and lateritic outcrops between Morawa and Southern Cross (George 1986). Populations of *X. divaricata* are disjunct and isolated and, consequently, so are the colonies of *T. waterhousei*. Our observations indicate that adults of *T. waterhousei* are very sedentary and seldom, if ever, move far from their food plants. They would, therefore, be unlikely to travel the large distances between many of the *Xerolirion*-supporting outcrops.

How populations of *X. divaricata* came to be isolated is not clearly understood. It is most likely the result of erosion processes in an old landscape over long periods of time (Greg Keighery, pers. comm.). The area in which *X. divaricata* occurs falls within the 'Southwest Australian Floristic Region', a global hotspot of plant biodiversity (Hopper and Gioia 2004). The region is immensely rich in plant species and origins of this diversity are complex. Recent phylogenetic studies have provided evidence of multiple dispersal events into, out of, and within this floristic region over several million years (Hopper and Gioia 2004). Indeed, many of the region's rare and threatened plant species are now found in disjunct, small populations similar to those of *X. divaricata*.

The fact that *T. waterhousei* is present on these isolated patches of *Xerolirion* suggests that both the plants and butterflies were more widespread in the past. As the range of *Xerolirion* became fragmented, the butterflies were marooned on small islands of food plant. *Xerolirion* grows on largely bare, rocky outcrops and this habit has no doubt reduced its susceptibility to fire, which in turn would have assisted the long-term survival of the butterflies.

That *T. waterhousei* larvae so readily switched to *A. preissii* in the laboratory is intriguing, given that *A. preissii* is essentially a near-coastal species and *X. divaricata* occurs in the semi-arid zone. The plants are 140 km apart at their closest point. *A. preissii* occurs at Mingenew, 50 km east of Dongara (Williams *et al.* 1996), and *X. divaricata* at Lochada Pastoral Station, 140 km further east.

It is interesting to speculate on how long the butterfly colonies might have persisted on these isolated patches of *Xerolirion* food plant. Hopper and Gioia (2004) hypothesised that this semi-arid area, with 300-600 mm of rainfall per annum, was a plant speciation hotspot of late-Tertiary antiquity. Although climatic conditions in southwestern Australia have been remarkably stable for a very long time (Hopper and Gioia 2004), there would have been periods when slightly moister conditions prevailed. If *A. preissii*

(or another *Acanthocarpus* sp.) occurred further inland for a time, it is possible that a temporary 'food plant bridge' may have linked the inland *Xerolirion* and present day near-coastal *A. preissii*. Indeed, there is still a remnant population of *A. preissii* at Mingenew, 50 km from the coast (Williams *et al.* 1993). This might explain the willingness of *T. waterhousei* larvae to feed on *A. preissii*, and might also explain why these long-isolated skipper colonies have not become morphologically distinct.

Phylogenetic studies are needed to better understand the relationships between *Xerolirion* and *Acanthocarpus*, and the Western Australian *Trapezites* skippers *T. waterhousei*, *T. argenteoornatus* (Hewitson), *T. sciron* Waterhouse & Lyell and *T. atkinsi* Williams, Williams & Hay, which utilise them as larval food plants (Williams *et al.* 1998). Similar studies are also required to establish whether there are any genetic differences between the scattered *T. waterhousei* populations.

Acknowledgements

We thank Greg Keighery and Robert Powell of the Department of Conservation and Land Management for critically reading the original manuscript.

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